

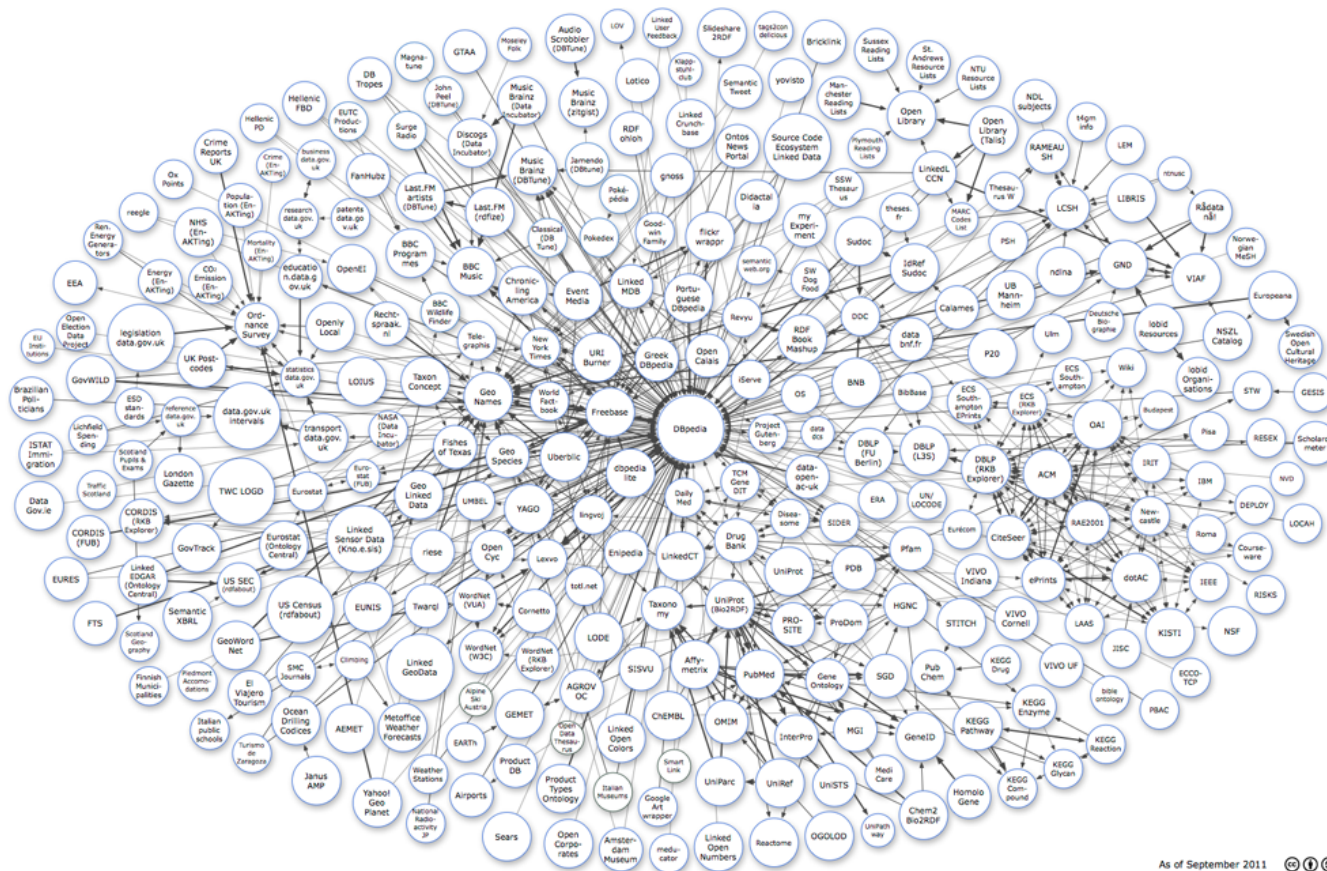
Tools for Enhanced Discovery on the Web

Jim Hahn & Qiang Jin

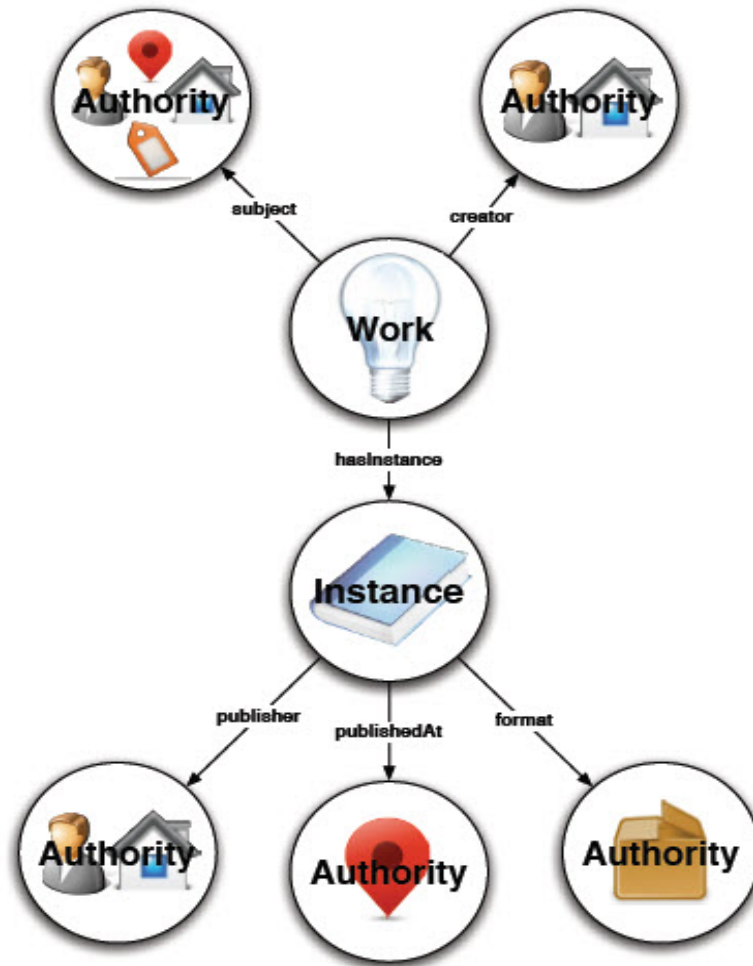
<https://sif.library.illinois.edu/bibframe>

UNIVERSITY LIBRARY
UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

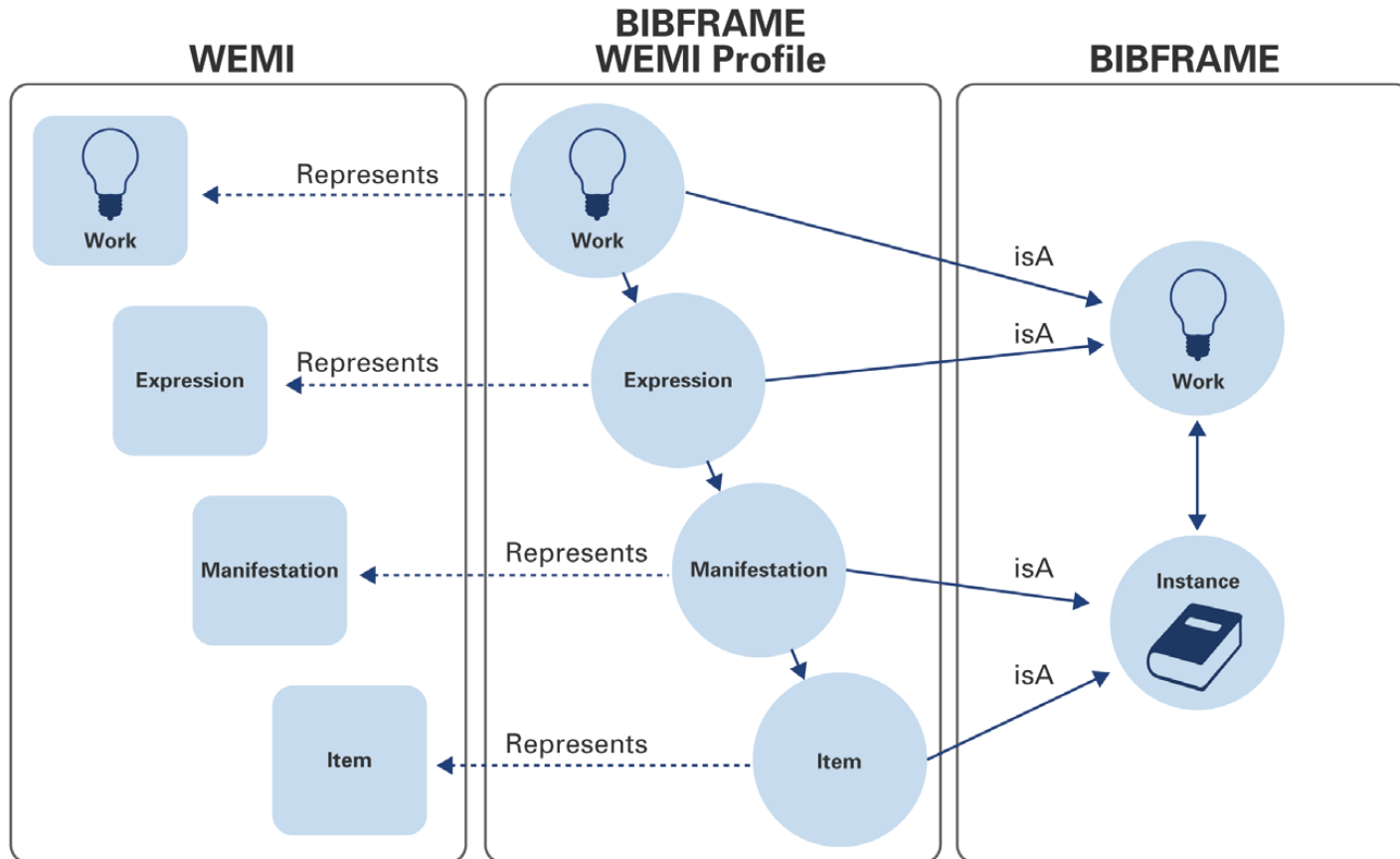
Linked Data



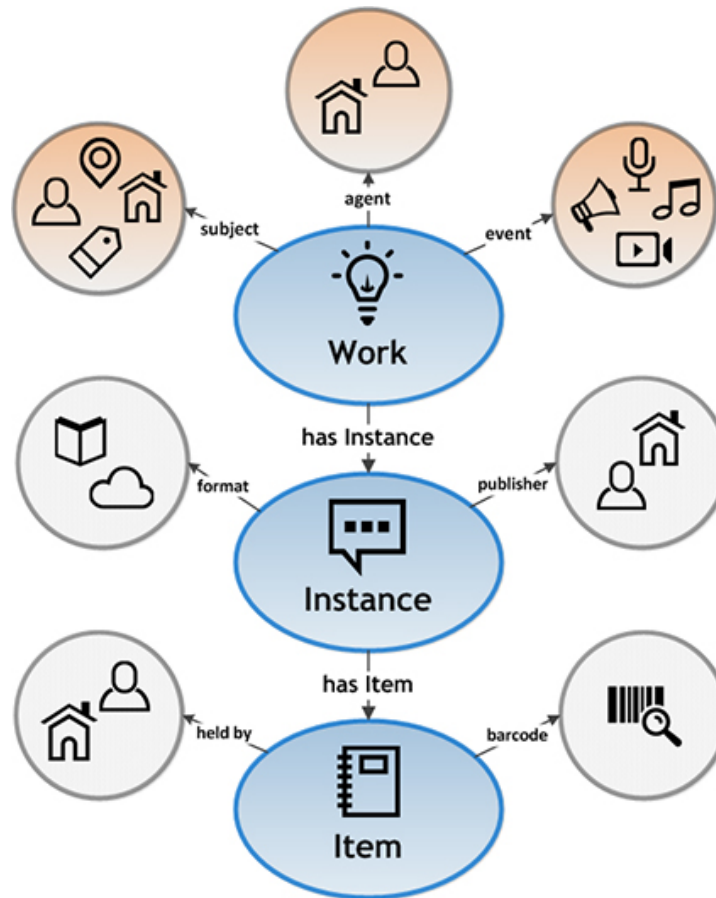
BIBFRAME MODEL 1.0



FRBR Work, Expression, Manifestation, and Instance mapped to BIBFRAME entities



BIBFRAME MODEL 2.0




BIBFRAME 1.0 tests at Illinois

- In order to support visibility of online resources on the web, we transformed nearly 300,000 e-books from the UIUC collection into linked data based on BIBFRAME model 1.0.
 - BIBFRAME XML for records
 - And Schema.org for webpage descriptions
 - Project page: <https://sif.library.illinois.edu/bibframe>



Secure | <https://sif.library.illinois.edu/bibframe/>

 **UNIVERSITY LIBRARY**
UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

BIBFRAME at University of Illinois

The end result of this project is enhanced discovery of library data – bringing like sets of content together in contemporary and easy to understand views assisting users in locating sets of associated bibliographic metadata.

"Initiated by the Library of Congress, [BIBFRAME](#) provides a foundation for the future of bibliographic description, both on the web, and in the broader networked world."

Last update: June 15, 2017

About

BIBFRAME Search Options

Linked Data Sources

Publications

Code + Acknowledgements

ABOUT

Funding + Scope

The project was initiated with funding from an Innovation Grant from the University of Illinois Library to explore transforming MARC records to BIBFRAME linked data. The proposal is available [here](#).

The project team chose to focus on the corpus of e-book records in the library catalog. The Illinois Library provides access to nearly 300,000 e-books.

By the end of the Summer 2015 semester the team completed the e-book work and two sample search interfaces demonstrating the feasibility of transforming & enriching MARC records with linked open data, and demonstrating approaches in retrieval of the records for enhanced discovery. Final Report available at: <http://goo.gl/Azjxkt>

Team

The team included librarians Qiang Jin (CAM) and Jim Hahn (UGL), as well as two graduate students: Gretchen Croll (GSLIS), and Suma Vangala (CS).

Additional Collaborators

We collaborated broadly and sought input from multiple metadata experts in the library, including Micheal Norman and Ayla Stein.

The BIBFRAME @ Illinois Project is registered with the Library of Congress [BIBFRAME implementation Register](#).

MARC to BIBFRAME Process

- Extract MARC XML
- Transform to BIBFRAME XML
- Enrich with linked data
- Index with Google Custom Search Engine
 - Using sitemaps for index construction

Programmatically extract MARC XML

- Generate Queries to gather unique bibliographic identifiers of all e-books in the library.
- Use these identifiers to generate MARC XML that can be input into the Library of Congress marc2bibframe Xquery transformation code.

Programmatically transform MARC XML to BIBFRAME XML

- `<bf:Person
rdf:about="http://www.base-
uri.com/7562776person6">`

Enrich BIBFRAME Elements

- `<bf:Person
rdf:about="http://viaf.org/viaf/2708
01804">`

Enrichment Process: Linked Data Sources

- Work Identifiers xISBN Worldcat Work ID
 - <http://xisbn.worldcat.org/xisbnadmin/index.htm>
- Personal Names, Corporate Names, and Geographic Names
 - <http://viaf.org/>
- Subject Headings
 - <http://id.loc.gov/>
 - <http://experimental.worldcat.org/fast/>
 - <https://id.nlm.nih.gov/mesh/>

Enrichment Code

- <https://bitbucket.org/minrvaproject-admin/bibframeuiuc/overview>

UIUC BIBFRAME 1.0 by RDF file

- Work.rdf
- Instance.rdf
- Annotation.rdf
- Authority.rdf

Since the e-book is of the web...

- Schema.org metadata was viewed as an important part of web discovery.

Schema.org within HTML

- `<div itemprop="author" itemscope
itemtype="http://schema.org/Person"><a
href="http://viaf.org/viaf/270801804"
itemprop="url"><span
itemprop="name">Crawford, J. Kent (James
Kent), 1953-</div>`

Schema.org

- Person
 - Book
 - Brand
 - Note, with regard to brand, there now exists within bib.schema.org a publishedBy property
- <http://bib.schema.org/publishedBy>



HTML Description of E-book



Dictionary of chemical engineering

Item(s)

Dictionary of chemical
engineering

Access

[e-Book](#)

LC Classification: TP9

Language: English

Held by: University of Illinois

Item Description





Summary:

Publisher: Oxford University Press, USA

ISBN(s): 0191002690, 1628708441, 9780191002694, 9781628708448

Notes: Description based on print version record.

HTML Description of E-book

Subject Terms / Creators
Schaschke, Carl.
Chemical engineering--Dictionaries
Chemical engineering
Electronic books
Dictionaries
Bibframe RDF
Work 
Instance 
Annotation 
Authority 

Fundamental Tools

- Google tools:
 - Google Webmaster Tools : Search Console
 - <https://www.google.com/webmasters/>
 - Google Structured Data Testing Tool
 - <https://search.google.com/structured-data/testing-tool/>
 - Google custom search engine.
 - <https://cse.google.com>

Index sitemaps for Google Custom Search Engine

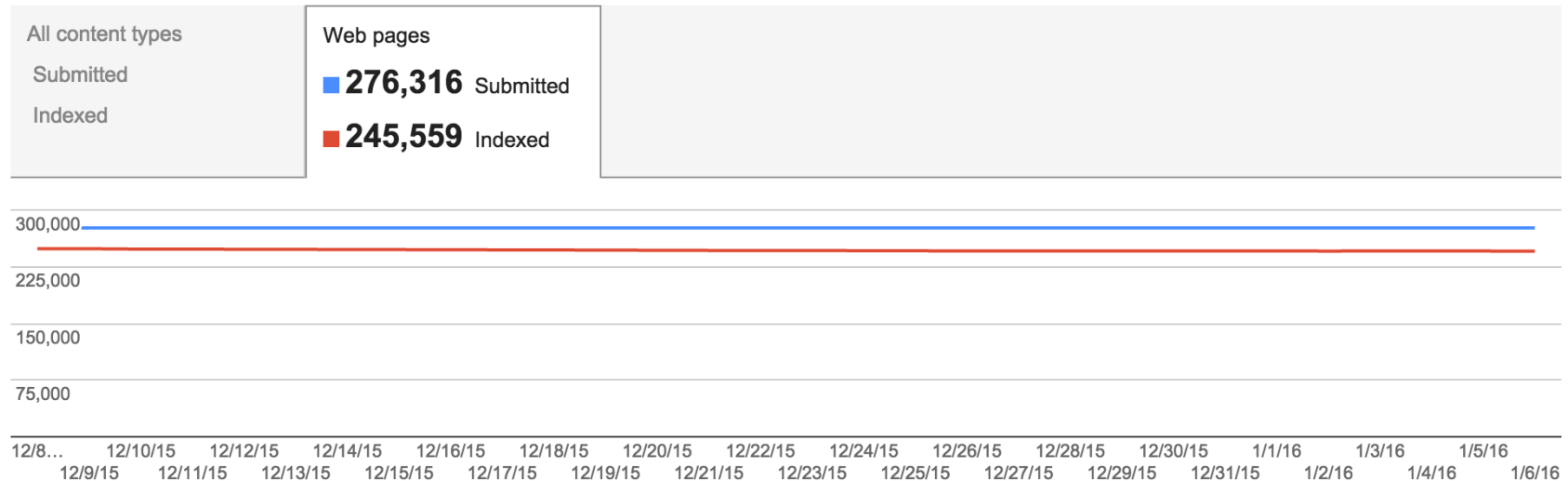
Sitemaps

[ADD/TEST SITEMAP](#)

By me (29)

All (29)

Sitemaps content (last 30 days shown)



Validating embedded linked data in HTML

Results - [Filter by use case](#)

how to: Determine the maturity of your organization's project management processes and use that information to address business needs Map a logical path to organization-wide process improvement Set priorities for short-term process improvement Assess the need for a project management office Track progress against your project management improvement plan Build and sustain a culture of project management excellence The book provides you with a conceptual framework to optimize specific project management processes and boost the capabilities of your organization. It presents best practices for determining portfolio maturity, setting short-term priorities, improving portfolio management processes, and tracking progress. It also includes a checklist for assessing your organization's project management maturity as well as an updated version of PM Solutions' Project Portfolio Management Maturity Model.

author [Person]:

url:	http://viaf.org/viaf/270801804
name:	Crawford, J. Kent (James Kent), 1953-

about [Book]:

url:	http://experimental.worldcat.org/fast/1078804/
name:	Project management--Mathematical models

about [CreativeWork]:

genre:	http://id.loc.gov/authorities/subjects/sh93007047
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Custom Search Result Filters

Google Custom Search of E-books

Search Bibframe V

Search:

SE

About 39 results (0.37 seconds)

[Dictionary of chemical engineering](#)
sif.library.illinois.edu

Dictionary of **chemical engineering**. Access
[Structured data](#)

[Chemical engineering](#)
sif.library.illinois.edu

Summary: Featuring a pragmatic, applied
[Structured data](#)

[Chemical engineering design](#)
sif.library.illinois.edu

Summary: OCy"OCyBottom line: For a holistic view of **chemical engineering** design, this book provides as much, if not more, than any other book available on ...
[Structured data](#)

Structured data : <http://sif.library.illinois.edu/bibframe/html/7262924.html> x

Person

url : Perry, Robert H., 1924-1978.
url : Green, Don W.

Book

name : Perry's chemical engineers' handbook
url : Chemical engineering--Handbooks, manuals, etc
url : Chemical engineering

Brand

name : McGraw-Hill

powered by Google™ Custom Search

ary ...

chemical ...



Custom Search Engine within Bento Search

Search Articles and Books

Search:

Articles

Total hits:

1408548

Response generation time (seconds):

1.082104191

[More of these →](#)

1. News. (Journal Article)

2007

The article offers news briefs related to engineering in Great Britain. The Chemicals Industry Association has reported that REACH REGULATIONS on the management and control of chemicals safety. The Engineering Employers Federation (EEF) has conducted a survey to 900 companies...

Books and Media

Total hits:

218119

Response generation time (seconds):

1.345852016

[More of these →](#)

1. Chemical engineering design principles, practice and economics of plant and process design (Text)

Towler, Gavin P. — 2008

Includes bibliographical references and index....
"Chemical Engineering Design is a complete course text for students of chemical engineering. Written for the Senior Design Course, and also suitable for introduction to chemical engineering courses, it covers the basics of unit...

E-Books

Total hits:

39

Response generation time (seconds):

0.359995766

[More of these →](#)

1. Dictionary of chemical engineering

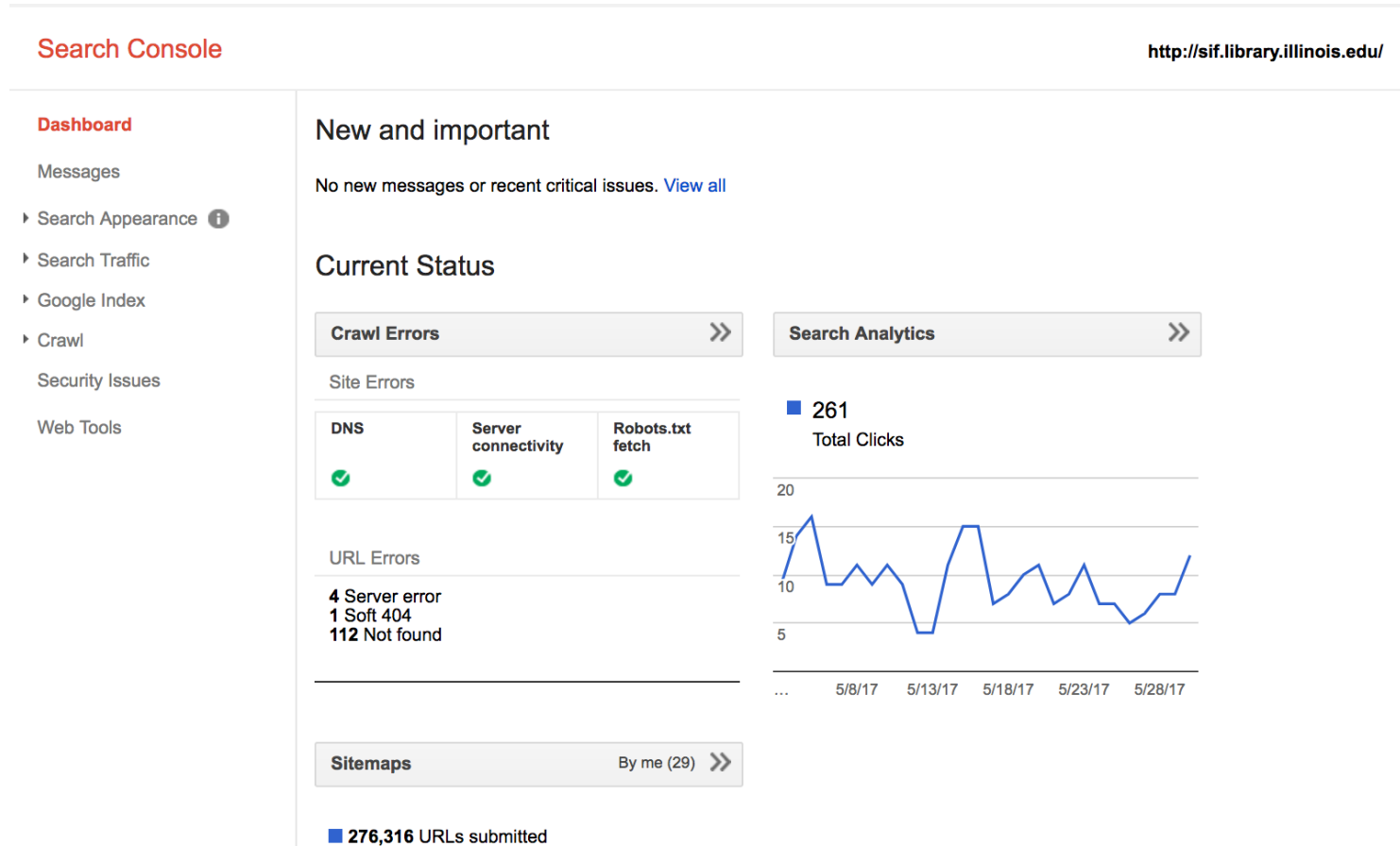
Dictionary of **chemical engineering**. Access. e-Book; LC Classification: TP9; Language: English; Held by: University of Illinois. Item Description. Summary ...

Published in
sif.library.illinois.edu/bibframe/html/7578470.html.

Outcomes and Analysis

- We are finding that for some unique titles, the linked data we added and the webpages for the e-resources are helping to bring these results to the top of the search results in Google.

Web Master Tools: Search Console





Search Analysis

Search Console

http://sif.library.illinois.edu/

Help



Dashboard

Messages

Search Appearance

Search Traffic

Search Analytics

Links to Your Site

Internal Links

Manual Actions

International Targeting

Mobile Usability

Google Index

Crawl

Security Issues

Web Tools

Search Analytics

Analyze your performance on Google Search. Filter and compare your results to better understand your user's search patterns. [Learn more.](#)

☒ Clicks ☐ Impressions ☐ CTR ☐ Position

☒ **Queries** ☐ Pages ☐ Countries ☐ Devices ☐ Search Type ☐ Dates
No filter ▼ No filter ▼ No filter ▼ No filter ▼ Web ▼ Last 28 days ▼

Total clicks

261

Clicks



Extended Search Analysis

<http://sif.library.illinois.edu/>

Help ▾



Search Analytics

Analyze your performance on Google Search. Filter and compare your results to better understand your user's search patterns. [Learn more.](#)

☒ Clicks ☐ Impressions ☐ CTR ☒ Position

☒ **Queries** ☐ Pages ☐ Countries ☐ Devices ☐ Search Type ☐ Dates
 No filter ▾ No filter ▾ No filter ▾ No filter ▾ Web ▾ Mar 2 - May 30 ▾

Total clicks

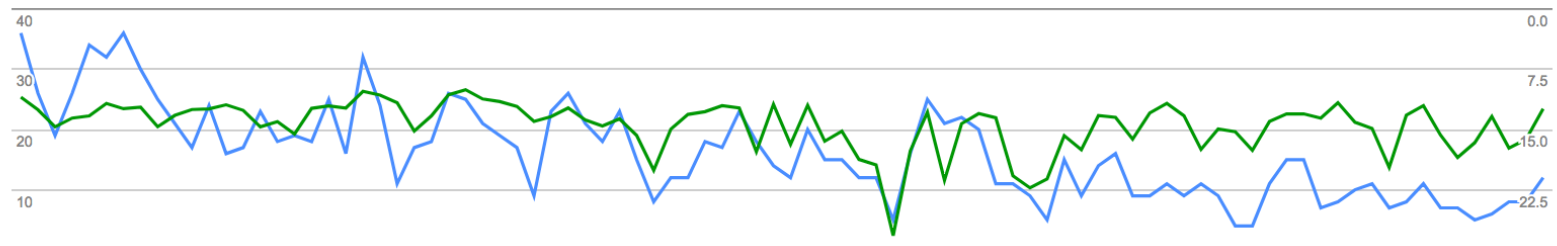
1,452

Avg. position


14.0

Clicks

Position



Example Google Search Results



[All](#)
[News](#)
[Images](#)
[Videos](#)
[Shopping](#)
[More](#)
[Settings](#)
[Tools](#)

About 88,700 results (0.53 seconds)

Fire in a Bangladesh Garment Factory - Harvard Business Review
<https://hbr.org/product/fire-in-a-bangladesh-garment-factory/TB0335-PDF-ENG> ▾
 May 20, 2013 - Access to case studies expires six months after purchase date. ... On November 2012, a fire in a garment factory near the Bangladesh capital of ...

[PDF] Fire and building safety in the ready-made garment - Better Work
<betterwork.org/.../BWB-Fire-and-building-safety-in-the-garment-sector-of-Banglades...> ▾
Case Study Fire and building safety in the ready-made garment sector of Bangladesh. Fire and building ... Bangladesh's garment industry has a long history of industrial ... Rana Plaza, a building housing five garment factories, collapsed in ...

Case study-of-tasreen-fashions-lt dt - SlideShare
<https://www.slideshare.net/SaddamHossain8/case-studyoftasreenfashionslt-dt> ▾
 Oct 15, 2015 - CASE STUDY OF TAZREEN FASHIONS LTD Introduction: The ... -12-27/after-the -tasreen-fire-in-bangladesh-more- fires-in-garment-factories 7.

Fire in a Bangladesh garment factory - University of Illinois Library
<sif.library.illinois.edu/bibframe/html/7595662.html> ▾
 Fire in a Bangladesh garment factory ... Clothing factories--Fires and fire prevention--Bangladesh--Case studies. Responsibility--Case studies. Bibframe RDF.
 You've visited this page 4 times. Last visit: 6/2/17

Preventing Factory Fires through Contracts: Case study of Garment ...
<https://thejournalofbusiness.org/index.php/site/article/view/757>
 by S Hideki - 2015 - [Related articles](#)
 Following a multi-decade history of lethal fires in the Bangladeshi garment industry, Sato (2012) proposed a contract framework that encourages manufacturers ...

Outcomes

- Found in our analysis of the google webmaster console that some works with unique titles are coming up in the top search results we still have more work to do for the entire corpus of e-books to come up on the web.
- In the previous 3 months **the average search result position of the index is 14**, or half way down the second page of google results.

Plans for the future

We experimented with different tools from Library of Congress, leveraging open linked data sources from the web, and several webmaster tools from Google.

Next phase of this project is to transform our nearly 300,000 into BIBFRAME 2.0 soon.

Works Consulted

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<https://www.w3.org/community/schemabibex/2015/06/24/bib-schema-org/>
- “Structured Data Testing Tool,” Google Developers, accessed June 16, 2017, developers.google.com/structured-data/testing-tool/
- “lcnetdev/marc2bibframe,” Github, accessed June 16, 2017, github.com/lcnetdev/marc2bibframe.

Works Consulted

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<http://journal.code4lib.org/articles/10668>
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https://github.com/jrochkind/sample_megasearch
- “Home - schema.org,” Schema.org, accessed June 16, 2017,
<https://schema.org/>
- Jason Ronallo, “HTML5 Microdata and Schema.org,” Code4Lib Journal, no. 16 (2012) accessed June 16, 2017,
<http://journal.code4lib.org/articles/6400>